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Relevance scale

1 Performance issues of a distributed frame buffer on a multicomputer

Bin Wei, Douglas W. Clark, Edward W. Felten, Kai Li, Gordon Stoll

August 1998 Proceedings of the ACM SIGGRAPH/EUROGRAPHICS workshop on **Graphics hardware**

Full text available: pdf(1.63 MB)

Additional Information: full citation, references, citings, index terms

Keywords: multi-port distributed frame buffer, multicomputers, parallel rendering, synchronization

² VC-1: a scalable graphics computer with virtual local frame buffers

Satoshi Nishimura, Tosiyasu L. Kunii

August 1996 Proceedings of the 23rd annual conference on Computer graphics and interactive techniques

Full text available: pdf(266.19 KB) Additional Information: full citation, references, index terms

Keywords: demand paging, frame buffers, parallel polygon rendering, scalable

The design of a parallel graphics interface

Homan Igehy, Gordon Stoll, Pat Hanrahan

July 1998 Proceedings of the 25th annual conference on Computer graphics and interactive techniques

Full text available: 🔂 pdf(389.52 KB) Additional Information: full citation, references, citings, index terms

InfiniteReality: a real-time graphics system

John S. Montrym, Daniel R. Baum, David L. Dignam, Christopher J. Migdal

August 1997 Proceedings of the 24th annual conference on Computer graphics and interactive techniques

Full text available: 📆 pdf(697.27 KB) Additional Information: full citation, references, citings, index terms

е ge h c ch e ge c ge

Hardware accelerated rendering of antialiasing using a modified a-buffer algorithm Stephanie Winner, Mike Kelley, Brent Pease, Bill Rivard, Alex Yen August 1997 Proceedings of the 24th annual conference on Computer graphics and

interactive techniques Full text available: 🔂 pdf(113.06 KB) Additional Information: full citation, references, citings, index terms

Keywords: antialiasing, image partitioning, plane equation evaluation, scanline, texture mapping, transparency

6 Hybrid volume and polygon rendering with cube hardware

Kevin Kreeger, Arie Kaufman

July 1999 Proceedings of the ACM SIGGRAPH/EUROGRAPHICS workshop on Graphics hardware

Full text available: pdf(1.85 MB) Additional Information: full citation, references, citings, index terms

Keywords: cube architecture, mixing polygons and volumes, ray casting, run-lengthencoding, volume rendering

7 Combatting rendering latency

Marc Olano, Jon Cohen, Mark Mine, Gary Bishop

April 1995 Proceedings of the 1995 symposium on Interactive 3D graphics

Additional Information: full citation, abstract, references, citings, index Full text available: pdf(2.97 MB)

Latency or lag in an interactive graphics system is the delay between user input and displayed output. We have found latency and the apparent bobbing and swimming of objects that it produces to be a serious problem for head-mounted display (HMD) and augmented reality applications. At UNC, we have been investigating a number of ways to reduce latency; we present two of these. Slats is an experimental rendering system for our Pixel-Planes 5 graphics machine guaranteeing a constant single NTSC ...

Talisman: commodity realtime 3D graphics for the PC

Jay Torborg, James T. Kajiya

August 1996 Proceedings of the 23rd annual conference on Computer graphics and interactive techniques

Full text available: 🔂 pdf(107.48 KB) Additional Information: full citation, references, citings, index terms

Dissertation Abstracts in Computer Graphics

January 1992 ACM SIGGRAPH Computer Graphics, Volume 26 Issue 1

Full text available: pdf(2.53 MB) Additional Information: full citation

¹⁰ Accelerated walkthrough of large spline models

Subodh Kumar, Dinesh Manocha, Hansong Zhang, Kenneth E. Hoff April 1997 Proceedings of the 1997 symposium on Interactive 3D graphics

f

Full text available: pdf(1.33 MB)

Additional Information: full citation, references, citings, index terms

11 Fast data parallel polygon rendering

F. A. Ortega, C. D. Hansen, J. P. Ahrens

December 1993 Proceedings of the 1993 ACM/IEEE conference on Supercomputing

Additional Information: full citation, references, citings, index terms Full text available: pdf(1.65 MB)

12 The rendering architecture of the DN10000VS

David Kirk, Douglas Voorhies

September 1990 ACM SIGGRAPH Computer Graphics, Proceedings of the 17th annual conference on Computer graphics and interactive techniques, Volume 24

Full text available: pdf(4.07 MB)

Additional Information: full citation, abstract, references, citings, index terms

The Appollo DN10000VS treats graphics as an integral part of the system architecture. Graphics requirements influence the entire system design. All floating-point computations for graphics are performed by the CPU(s), while rasterizing is handled by simplified hardware having no microcode. We decided to support alpha buffering, quadratic interpolation, and texture mapping directly in hardware. This partitioning reduces the cost of a high-end workstation, without sacrificing high rendering qualit ...

13 The triangle processor and normal vector shader: a VLSI system for high performance graphics

Michael Deering, Stephanie Winner, Bic Schediwy, Chris Duffy, Neil Hunt June 1988 ACM SIGGRAPH Computer Graphics, Proceedings of the 15th annual conference on Computer graphics and interactive techniques, Volume 22 Issue 4

Full text available: pdf(2.29 MB)

Additional Information: full citation, abstract, references, citings, index

Current affordable architectures for high-speed display of shaded 3D objects operate orders of magnitude too slowly. Recent advances in floating point chip technology have outpaced polygon fill time, making the memory access bottleneck between the drawing processor and the frame buffer the most significant factor to be accelerated. Massively parallel VLSI system have the potential to bypass this bottleneck, but to date only at very high cost. We describe a new more affordable VLSI solution. A pi ...

Keywords: graphics VLSI, hardware lighting models, interpolation, real-time image display, shading, triangle processor

14 Scalable distributed visualization using off-the-shelf components

Alan Heirich, Laurent Moll

October 1999 Proceedings of the 1999 IEEE symposium on Parallel visualization and graphics

Full text available: pdf(1.81 MB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, index terms

This paper describes a visualization architecture for scalable computer systems. The architecture is currently being prototyped for use in Beowulf-class clustered systems. A set of OpenGL frame buffers are driven in parallel by a set of CPUs. The visualization architecture merges the contents of these frame buffers by user-programmable associative and commulative combining operations. The system hardware is built from off-the-shelf components including OpenGL accelerators, Field Programmabl ...

e ge h c ch e ge c Keywords: Beowulf, FPGA, OpenGL, cluster, fat-tree, gigabit, visualization

15 A scalable parallel cell-projection volume rendering algorithm for three-dimensional unstructured data

Kwan-Liu Ma, Thomas W. Crockett

October 1997 Proceedings of the IEEE symposium on Parallel rendering

Full text available: pdf(1.67 MB) Additional Information: full citation, references, citings, index terms

Keywords: asynchronous communication, distributed memory, hierarchical data structures, load balancing, message passing, parallel algorithms, scientific visualization, unstructured grids, volume rendering

16 Hardware acceleration for Window systems

D. Rhoden, C. Wilcox

July 1989 ACM SIGGRAPH Computer Graphics, Proceedings of the 16th annual conference on Computer graphics and interactive techniques, Volume 23 Issue 3

Full text available: pdf(1.81 MB)

Additional Information: full citation, abstract, references, citings, index terms

Graphics pipelines are quickly evolving to support multitasking workstations. The driving force behind this evolution is the window system, which must provide high performance graphics within multiple windows, while maintaining interactivity. The virtual graphics system presented by [7] provides a clean solution to the problem of context switching graphics hardware between processes, but does not solve all the problems associated with sharing graphics pipelines. The primary difficulty in context ...

17 PixelFlow: high-speed rendering using image composition

Steven Molnar, John Eyles, John Poulton

July 1992 ACM SIGGRAPH Computer Graphics , Proceedings of the 19th annual conference on Computer graphics and interactive techniques, Volume 26 Issue 2

Full text available: pdf(2.31 MB) Additional Information: full citation, references, citings, index terms

Keywords: anialiasing, compositing, deferred shading, rendering, scalable

18 A task adaptive parallel graphics renderer

Scott Whitman

e

November 1993 Proceedings of the 1993 symposium on Parallel rendering

Full text available: pdf(1.15 MB) Additional Information: full citation, references, citings, index terms, review

19 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research

Full text available: pdf(4.21 MB) Additional Information: full citation, abstract, references, index terms

Understanding distributed applications is a tedious and difficult task. Visualizations based on

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process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

20 A MIMD rendering algorithm for distributed memory architectures

Thomas W. Crockett, Tobias Orloff

November 1993 Proceedings of the 1993 symposium on Parallel rendering

Full text available: pdf(1.16 MB)

Additional Information: full citation, references, citings, index terms

Keywords: asynchronous algorithms, multiprocessors, parallel polygon rendering, performance analysis

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1 Performance analysis and design of a logic simulation machine

K. Wong, M. A. Franklin

June 1987 Proceedings of the 14th annual international symposium on Computer architecture

Full text available: pdf(941.01 KB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u> <u>terms</u>

The high costs associated with logic simulation of large VLSI circuits has led to the need for new computer architectures tailored to the simulation task. Such architectures have the potential for significant speed-ups over software-based logic simulators executing on standard sequential computers. This paper presents a model of one class of multiprocessor simulation architectures and compares the performance of some of these machines using data obtained from simulations of VLSI circuits. I ...

² A hardware accelerator for speech recognition algorithms

T. S. Anantharaman, R. Bisiani

June 1986 ACM SIGARCH Computer Architecture News, Proceedings of the 13th annual international symposium on Computer architecture, Volume 14 Issue 2

Full text available: pdf(729.28 KB)

Additional Information: $\underline{\text{full citation}}$, $\underline{\text{abstract}}$, $\underline{\text{references}}$, $\underline{\text{citings}}$, $\underline{\text{index}}$

This paper describes two custom architectures tailored to a speech recognition beam search algorithm. Both architectures have been simulated using real data and the results of the simulation are presented. The paper also describes the design process of the custom architectures and presents a number of ideas on the automatic design of custom systems for data dependent computations.

3 A hardware accelerator for maze routing

Y. Won, S. Sahni, Y. El-ziq

e

October 1987 Proceedings of the 24th ACM/IEEE conference on Design automation

Full text available: pdf(871.73 KB) Additional Information: full citation, abstract, references, index terms

A hardware accelerator for the maze routing problem is developed. This accelerator consists of three 3 stage pipelines. Banked memory is used to avoid memory read/write conflicts and obtain maximum efficiency.

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Hardware acceleration for Window systems

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D. Rhoden, C. Wilcox

July 1989 ACM SIGGRAPH Computer Graphics, Proceedings of the 16th annual conference on Computer graphics and interactive techniques, Volume 23 Issue 3

Full text available: pdf(1.81 MB)

Additional Information: full citation, abstract, references, citings, index

Graphics pipelines are quickly evolving to support multitasking workstations. The driving force behind this evolution is the window system, which must provide high performance graphics within multiple windows, while maintaining interactivity. The virtual graphics system presented by [7] provides a clean solution to the problem of context switching graphics hardware between processes, but does not solve all the problems associated with sharing graphics pipelines. The primary difficulty in context ...

5 A vector hardware accelerator with circuit simulation emphasis

A. Vladimirescu, D. Weiss, M. Katevenis, Z. Bronstein, A. Kifir, K. Danuwidjaja, K. C. Ng., N. Jain, S. Lass

October 1987 Proceedings of the 24th ACM/IEEE conference on Design automation

Full text available: pdf(591.83 KB) Additional Information: full citation, abstract, references, index terms

A floating-point vector accelerator has been built which runs circuit simulation efficiently. The design considerations of the accelerator are based on the time-consuming parts of SPICE2, available off-the-shelf parts, advanced software tools experience and cost/performance. The three board accelerator can run the entire application program compiled from a high-level language. A personal workstation, such as the PC-AT, is used for the general I/O tasks such as file handling and n ...

6 Architecture and design of the MARS hardware accelerator

P. Agrawal, W. J. Dally, A. K. Ezzat, W. C. Fischer, H. V. Jagadish, A. S. Krishnakumar October 1987 Proceedings of the 24th ACM/IEEE conference on Design automation

Full text available: pdf(1.49 MB)

Additional Information: full citation, abstract, references, citings, index terms

MARS (Microprogrammable Accelerator for Rapid Simulations) is a multiprocessor based hardware accelerator capable of efficiently implementing a wide range of computationally complex algorithms. Its architecture is ideally suited for performing event driven simulations of VLSI circuits. The highly pipelined and parallel architecture of MARS provides a performance comparable to existing hardware simulation engines while its highly flexible architecture supports a wide range of applications. F ...

7 Overview of a high-performance programmable pipeline structure

Franc, ois Bodin, Franc, ois Charot, Charles Wagner

June 1986 Proceedings of the 3rd international conference on Supercomputing

Full text available: pdf(2.05 MB) Additional Information: full citation, abstract, references, index terms

This paper aims at describing a high-performance programmable pipeline architecture consisting of a linear array of PCS processors. The PCS processor which is capable of performing 20 million floating-point operations per second (20 MFLOPS) has been built from off-the-shelf chips on a wire-wrapped board. The prototype processor is attached to a SUN-3 workstation. Efficient microcode is generated using the microcode compiler that has been designed and implemented. The microcode op ...

Texture shaders

Michael D. McCool, Wolfgang Heidrich

July 1999 Proceedings of the ACM SIGGRAPH/EUROGRAPHICS workshop on Graphics hardware

Full text available: pdf(1.36 MB) Additional Information: full citation, references, citings, index terms

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ge f Keywords: BRDFs, OpenGL, hardware acceleration and interactive rendering, illumination, shading languages, shadows

The Parallel Protocol Engine

Matthias Kaiserswerth

December 1993 IEEE/ACM Transactions on Networking (TON), Volume 1 Issue 6

Full text available: pdf(1.65 MB) Additional Information: full citation, references, citings, index terms, review

10 Continuous profiling: where have all the cycles gone?

Jennifer M. Anderson, Lance M. Berc, Jeffrey Dean, Sanjay Ghemawat, Monika R. Henzinger, Shun-Tak A. Leung, Richard L. Sites, Mark T. Vandevoorde, Carl A. Waldspurger, William E. Weihl

October 1997 ACM SIGOPS Operating Systems Review, Proceedings of the sixteenth ACM symposium on Operating systems principles, Volume 31 Issue 5

Additional Information: full citation, references, citings, index terms Full text available: pdf(2.29 MB)

11 Continuous profiling: where have all the cycles gone?

Jennifer M. Anderson, Lance M. Berc, Jeffrey Dean, Sanjay Ghemawat, Monika R. Henzinger, Shun-Tak A. Leung, Richard L. Sites, Mark T. Vandevoorde, Carl A. Waldspurger, William E. Weihl

November 1997 ACM Transactions on Computer Systems (TOCS), Volume 15 Issue 4

Additional Information: full citation, abstract, references, citings, index Full text available: pdf(259.35 KB) terms

This article describes the Digital Continuous Profiling Infrastructure, a sampling-based profiling system designed to run continuously on production systems. The system supports multiprocessors, works on unmodified executables, and collects profiles for entire systems, including user programs, shared libraries, and the operating system kernel. Samples are collected at a high rate (over 5200 samples/sec. per 333MHz processor), yet with low overhead (1-3% slowdown for most workloads). A ...

Keywords: performance understanding, performance-monitoring hardware, profiling, program analysis

12 Hardware speedups in long integer multiplication

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M. Shand, P. Bertin, J. Vuillemin

May 1990 Proceedings of the second annual ACM symposium on Parallel algorithms and architectures

Full text available: 📆 pdf(939.04 KB) Additional Information: full citation, references, citings, index terms

13 Parallel logic simulation of VLSI systems

Mary L. Bailey, Jack V. Briner, Roger D. Chamberlain September 1994 ACM Computing Surveys (CSUR), Volume 26 Issue 3

Additional Information: full citation, abstract, references, citings, index Full text available: pdf(3.74 MB) terms

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Fast, efficient logic simulators are an essential tool in modern VLSI system design. Logic simulation is used extensively for design verification prior to fabrication, and as VLSI systems grow in size, the execution time required by simulation is becoming more and more significant. Faster logic simulators will have an appreciable economic impact, speeding time to market while ensuring more thorough system design testing. One approach to this problem is to utilize parallel processing, taking ...

Keywords: circuit structure, parallel architecture, parallelism, partitioning, synchronization algorithm, timing granularity

14 Reconfigurable technology: an innovative solution for parallel discrete event simulation support

C. Beaumont, P. Boronat, J. Champeau, J.-M Filloque, B. Pottier

July 1994 ACM SIGSIM Simulation Digest, Proceedings of the eighth workshop on

Parallel and distributed simulation, Volume 24 Issue 1

Full text available: pdf(453.05 KB)

Additional Information: full citation, abstract, references, citings, index terms

Accelerating discrete event simulation can be achieved by using parallel architectures. The use of dedicated hardware is a possible alternative in some special domains like logic simulation. However, few studies have focused on general cases. This paper presents an innovative solution using a recent hardware technology called FPGA (Field Programmable Gate Array), that enables dynamic synthesis of application specific hardware. Each node of an MIMD parallel machin ...

15 The M-Machine multicomputer

Marco Fillo, Stephen W. Keckler, William J. Dally, Nicholas P. Carter, Andrew Chang, Yevgeny Gurevich, Whay S. Lee

December 1995 Proceedings of the 28th annual international symposium on Microarchitecture

Full text available: pdf(1.29 MB) Additional Information: full citation, references, citings, index terms

16 Hybrid volume and polygon rendering with cube hardware

Kevin Kreeger, Arie Kaufman

July 1999 Proceedings of the ACM SIGGRAPH/EUROGRAPHICS workshop on Graphics hardware

Full text available: pdf(1.85 MB) Additional Information: full citation, references, citings, index terms

Keywords: cube architecture, mixing polygons and volumes, ray casting, run-length-encoding, volume rendering

17 The design of a parallel graphics interface

Homan Igehy, Gordon Stoll, Pat Hanrahan

July 1998 Proceedings of the 25th annual conference on Computer graphics and interactive techniques

Full text available: pdf(389.52 KB) Additional Information: full citation, references, citings, index terms

18 A survey of commercial parallel processors

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Edward Gehringer, Janne Abullarade, Michael H. Gulyn September 1988 ACM SIGARCH Computer Architecture News, Volume 16 Issue 4

Additional Information: full citation, abstract, citings, index terms Full text available: pdf(2.96 MB)

This paper compares eight commercial parallel processors along several dimensions. The processors include four shared-bus multiprocessors (the Encore Multimax, the Sequent Balance system, the Alliant FX series, and the ELXSI System 6400) and four network multiprocessors (the BBN Butterfly, the NCUBE, the Intel iPSC/2, and the FPS T Series). The paper contrasts the computers from the standpoint of interconnection structures, memory configurations, and interprocessor communication. Also, the share ...

19 VC-1: a scalable graphics computer with virtual local frame buffers

Satoshi Nishimura, Tosiyasu L. Kunii

August 1996 Proceedings of the 23rd annual conference on Computer graphics and interactive techniques

Full text available: Description Additional Information: full citation, references, index terms

Keywords: demand paging, frame buffers, parallel polygon rendering, scalable

²⁰ Scalable distributed visualization using off-the-shelf components

Alan Heirich, Laurent Moll

October 1999 Proceedings of the 1999 IEEE symposium on Parallel visualization and graphics

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u> Full text available: pdf(1.81 MB) terms

This paper describes a visualization architecture for scalable computer systems. The architecture is currently being prototyped for use in Beowulf-class clustered systems. A set of OpenGL frame buffers are driven in parallel by a set of CPUs. The visualization architecture merges the contents of these frame buffers by user-programmable associative and commulative combining operations. The system hardware is built from off-the-shelf components including OpenGL accelerators, Field Programmabl ...

Keywords: Beowulf, FPGA, OpenGL, cluster, fat-tree, gigabit, visualization

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